

071304T4RAC

Refrigeration and Air Conditioning Artisan - Level 4

ENG/OS/RAC/CC/02/4/A

Apply Basic Mathematics

July/August 2023



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

Time: 2 hours

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections; **A** and **B**.
2. Answer **ALL** questions in sections **A** and **B**.
3. Maximum marks for each part of a question are as indicated.
4. You should have a non-programmable scientific calculator
5. You are provided with a separate answer booklet.
6. Marks for each question are indicated in the brackets.
7. Do not write on the question paper.

*This paper consists of FOUR (4) printed pages
Candidates should check the question paper to ascertain that all pages are printed as indicated
and that no questions are missing*

SECTION A (10MARKS)

(Answer **ALL** the questions in this section)

1. 20000 kg of refrigerant is equivalent to _____ liters of refrigerant.
 - A. 20
 - B. 2.0
 - C. 0.20
 - D. 200

2. The decimal equivalent of $\frac{7}{8}$ is _____.
 - A. 0.125
 - B. 0.7
 - C. 0.78
 - D. 0.875

3. The area of a square sided 4.10m is _____.
 - A. $16.810m^2$
 - B. $16.8m^2$
 - C. $16.4m^2$
 - D. $168.10m^2$

4. Write $\frac{3}{5}$ in percentage (%) form.
 - A. 6%
 - B. 600%
 - C. 60%
 - D. 0.6%

5. The correct formulae for finding the area of a circle is _____.
 - A. πr^2
 - B. $\frac{1}{3}\pi r^2$
 - C. $\frac{1}{2} \times base \times height$
 - D. $\frac{4}{3}\pi r^3$

6. The value of $10^3 \times 10^0$ is _____.
- A. 1000
 - B. 0
 - C. 100
 - D. 10
7. Supply air into the air-conditioned room has 20m^3 outside air and 15m^3 recirculated air. The ratio of recirculated air to outside air is _____.
- A. 4:3
 - B. 3:4
 - C. 4:5
 - D. 7:9
8. The two numbers that are allowed in binary representation are _____.
- A. 0 and 1
 - B. 0 and 2
 - C. 1 and 2
 - D. 1 and 3
9. The following are units of measuring volume except _____.
- A. litres
 - B. millilitres
 - C. kilolitre
 - D. decimetre
10. The following are types of 3D figures except _____.
- A. Cuboid
 - B. Cylinder
 - C. Cone
 - D. Trapezium

SECTION B (40MARKS)*Answer ALL the questions in this section*

11. Evaluate the following: $7\frac{1}{8} - 5\frac{3}{7}$ (3 marks)
12. A refrigerant cylinder contains 180 litres of refrigerant. How many compressors containing 0.75 litres can be filled from this cylinder? (3 marks)
13. A piece of a copper pipe 273 cm long is cut into three pieces in the ratio of 3:7:11. Determine the lengths of the three pieces. (4 marks)
14. Find the value of $\frac{3^3 \times 3^4}{3^7 \times 3^5}$ (3 marks)
15. Express $\frac{4}{9}$ in standard form, correct to 3 significant figures. (2 marks)
16. If a compressor oil storage tank is holding 450 litres when it is three-quarters full, how much will it contain when it is two-thirds full? (4 marks)
17. In an electrical circuit the voltage is given by Ohms law, that is $V = IR$. Find, correct to 2 decimal places, the voltage when $I = 5.36A$ and $R = 14.76\Omega$. (3 marks)
18. Find the sum of $4a, 3b, c, -2a, -5b$ and $6c$. (4 marks)
19. Solve the equation: $6x + 1 = 2x + 9$ (3 marks)
20. A supervisor and 4 laborers together earn Kshs. 8650 per week, whilst 4 supervisors and 9 laborers earn Kshs. 23400 basic per week. Determine the basic weekly wage of a supervisor and a laborer. (5 marks)
21. Without plotting a graph, determine the gradient and y-axis intercept values of the equation; $y - 7x = -3$. (3 marks)
22. What must be added to each term of the ratio 2:3, so that it may become equal to 4:5? (3 marks)